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A manual and
outline for the teaching
of agriculture



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A MANUAL AND OUTLINE FOR THE TEACHING OF AGRICULTURE



IN THE ELEMENTARY SCHOOLS OF OREGON

BY J. A. CHURCHILL
Superintendent of Public Instruction

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FOREWORD

For many years agriculture has been one of the recognized subjects of instruction in the eighth grade of the elementary school system of Oregon. In recognition of this, standard texts have been adopted from time to time by the state textbook commission and recommended for use to teachers handling the subject.

Experience has shown that few teachers have made the necessary effort to prepare themselves properly for teaching elementary agriculture. Occasionally one may be found possessing a live interest in rural affairs and having a natural preference for those details which are closely related to farm life. The very large majority of country school teachers have neither the training or inclination to lead their pupils successfully in a study which is so foreign to their own experience.

To enable such teachers to take the standard text adopted by the state textbook commission and use it efficiently, the following suggested outline has been prepared for their guidance. It will be of assistance to high school instructors who are conducting classes in the elementary teachers' training classes. It contains the essentials that elementary teachers must know in order to properly handle the course during the year 1922-23. No examination in agriculture will be required of eighth grade pupils prior to 1923. It is proposed that teachers applying for certification in May and June, 1923, and afterwards, will take the examination in agriculture on questions based upon this outline. Ample time is thus afforded for teachers without sufficient preparation to become familiar with this subject before the necessity of facing the examination arises, and a distinct advantage will be gained by the teaching experience of the preceding year.

This outline was prepared by Mr. E. E. Elliott, state director for vocational education, to whom we wish to express our grateful acknowledgment.

J. A. CHURCHILL,
Superintendent of Public Instruction.

SCOPE OF THE OUTLINE

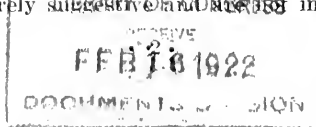
This outline is based on the approved text, Davis' "Productive Farming," and in reality constitutes a brief manual for the aid of teachers. While the text is an excellent presentation of the practical phases of agriculture, it is necessarily quite general in character and not altogether adapted to western conditions. This outline aims to adjust the text more nearly to the variable conditions found in each local community. It is apportioned on the basis of thirty-two weeks, which is the minimum time based on the eight months' term of school. This time distribution is suggestive only and will necessarily vary greatly in different schools and under the inclinations of different teachers. The inexperienced teacher, however, will do well to follow it somewhat closely. One week has been allowed for review and examination.

For those who feel competent the outline may be followed in what is termed the seasonal method. By this is meant the taking up of certain subtopics at the season when they may be studied to the best advantage.

The review questions should always be used following the completion of each assignment. The teacher should keep future lesson assignments constantly in mind and plan and prepare the various exercises in advance so that they may be ready when needed. The sprouting of seeds, the development of root hairs, the incubation of insect pests and similar exercises should all be anticipated and made ready in ample time.

While this outline follows closely the recommended text, teachers should learn in time to use it merely as a basis for more extended study and classwork.

As a further aid to the teacher in working up the lessons under each topic, several complete outlines have been prepared which may be used as models. These are merely suggestions and are not intended to be followed in their entirety.



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Suggestions for a Text Outline of Davis' "Productive Farming"

OUTLINE OF TOPICS

Using the table of contents the text has been divided into twenty-four sections, each to be covered by one week or more of study. Certain topics in the text, like cotton, tobacco, and sweet potatoes, are omitted entirely. Each of these sections will be handled as a topic and the time used upon it may be limited or extended as the subject is of importance or the interest of the pupils may justify.

This arrangement of subject matter is prepared to correspond with the table of contents as given in the approved text, Davis' "Productive Farming." The relative importance of each topic is indicated by the amount of time suggested for its study. This will doubtless vary in different sections of the state according to the local conditions and interests. Teachers should make an effort to familiarize themselves with local agricultural conditions and adapt the classwork accordingly.

1. The Structure and Physiology of Plants.

Chapter I. Divide this topic into at least five lessons. Two weeks may be spent profitably upon it. For method see suggested treatment for Lesson 1. Time: one week.

2. Plant Improvement; Seeds.

Chapter II. Five lessons. At the outset start germination tests as shown on page 27. If possible secure small magnifier for the study of seeds. Use all the suggested exercises. Time allowed, at least one week.

3. Producing Plants Without Seeds.

Chapter III. Five lessons. Emphasize the methods necessary to propagate the fruits of local importance. Time: one week. U. S. Farmers' Bulletin No. 157 is very helpful.

4. How Soils Are Formed.

Chapter IV. This topic is important and should be supplemented by an observation trip to study the origin of local soils. The formative forces on page 45 can be made very interesting. Time: one week.

5. Characteristics of Different Kinds of Soils.

Chapter V. Lay stress upon the differences in soils, ranging from coarse sand to swamp peat. The text does not supply enough exercises for this chapter, and teacher should supplement these. Time: one week.

6. Soil Moisture.

Chapter VI. This topic can best be handled in the laboratory where conditions can be controlled, rather than by field observation. Use exercises on pages 63 and 64. The mulch test should be conducted out of doors, if weather conditions will permit. Time: one week.

7. Land Drainage.

Chapter VII. In some sections this topic is of slight importance. Where rainfall is heavy and where irrigation is practiced it can be studied to advantage. What drainage does should be emphasized. Time: one week or less.

8. Soil Improvement.

Chapter VIII. Taking the four kinds of improvement suggested on page 72, discuss this topic solely from the standpoint of the practical methods followed by the ordinary farmer: good tillage, stable manures, improvement crops, the use of lime, and, last, commercial fertilizers. Time: two weeks.

9. Systems of Cropping.

Chapter IX. The distinction between special and general farming can be noted in every section of Oregon. The advantages and disadvantages of each system should be the basis of this study. Rotation is easily studied on the farms of the neighborhood. This topic calls for considerable field study and can not be handled successfully otherwise. Time: one week.

10. Farm Crops.

Chapter X. The classification of crops as given on page 97 should be closely adhered to in discussing. The topic logically follows that studied in the preceding chapter. The great importance of forage crops is the key to chapter X. Be sure to have pupils secure samples of all that may be found in the surrounding country. Time: one week.

11. Alfalfa.

Chapter XI. The great importance of alfalfa in the agriculture of Oregon must not be overlooked. Western counties will devote less time to the topic than those where alfalfa has come to be the leading forage crop. Time: one week.

12. Corn.

Chapter XIII. The study of cotton has been entirely omitted but the value of corn as an Oregon crop is of sufficient importance to justify a full week of study. Material is always available. The topic affords a splendid opportunity for germination tests and the study of conditions necessary to improve and preserve seed. Time: two weeks.

13. Wheat.

Chapter XIV. This great bread crop is of such importance that it should be studied by every pupil. In some counties wheat is the main crop, and there are few places in the state where it is not grown. Even in these the study can be made most interesting by an exhibit of types, varieties, maps showing the wheat area, and pictures of harvesting operations. Germination tests are fascinating. If a flouring mill is in the vicinity take the pupils through it and learn how flour is produced. Time: one week.

14. Other Special Grain Crops; Oats, Barley, Rye, Flax.

Chapter XIV. A day to each of these crops is none too much. All of them figure largely in the agriculture of the state. Samples of grains and of the manufactures produced from flax would be very helpful. In each case methods of cultivation and the use of the crop should be emphasized. Time: one week.

15. Potatoes.

Chapter XV. The potato crop is of such universal importance that it should receive full study. Divide the chapter into at least eight lessons and have pupils bring in samples of varieties for study and experiment. It would be wise to discuss the topic at some season, either in the fall or spring, when field observation can be made. Omit extended study of sweet potatoes except for the sake of comparison, as they are rarely grown in the state. Time: two weeks.

16. Trees.

Chapter XVII. It will be noted that tobacco is omitted from this outline. If the teacher feels competent, the study of trees and their influence on agriculture may be made most interesting to the ordinary grade pupil. Tree seeds and plantings, varieties, effect on climate, uses of timber, etc., all have value for study. Have samples of different woods brought, especially cross sections as suggested on page 187. Ornamental planting around homes should not be forgotten. Time: one week.

17. Gardening and Garden Crops.

Chapter XVIII. Since gardening is one of the phases of agriculture in which pupils in the grades have been successfully interested through the agency of club work, it should be studied quite thoroughly. The assistance of the local club leader can be used to good advantage in this connection. It is suggested that the topic be scheduled for the early spring season. A hotbed might not be practicable, but seeds can be started successfully in the schoolroom or at home. This general topic should be extended through a period of from two to three weeks according to the conditions and inclination of the teacher. Time minimum: two weeks.

18. Fruit Growing.

Chapter XIX. There are very few sections of Oregon where some form of fruit growing is not possible. The teacher should be posted on the local possibilities and be governed by these. Topic 2 on Plant Propagation should be reviewed. The study should take the pupils out frequently for observation. The text is well arranged to cover this subject. On account of its importance, full time is suggested. Time: two weeks.

19. Insects: Beneficial and Injurious.

Chapter XX. Make definite and clear the habits of life and structure of insects and the difference in their habits of feeding. On these two facts depends the problem of control over those considered injurious to plant life. If handled at the proper season much interest can be aroused by having students collect insects, cocoons, or caterpillars. Follow directions for killing and preserving as found on pages 238 and 239. Get the Experiment Station Bulletins from O. A. C. describing means of insect control. It will be easy to absorb the time allowed—two weeks.

20. Diseases of Plants.

Chapter XXI. Distinguish clearly between insect pests and diseases of plants. This is not always understood. Show that spraying may or may not control both. The teacher who has studied biology will find it of great help in handling this topic. Time: one week.

21. Domestic Animals; Horses.

Omit Chapter XXII, except as a reading lesson, and take up Chapter XXIII. The distinctions between breeds are difficult to teach under ordinary circumstances and study should be limited to a few of the best known. Stress the study of the horse, his points, habits and characteristics. Care and management should be studied as well as inspection and judging. The help of some good local horseman should be secured if possible. Time: one week.

22. Domestic Animals; Cattle.

Chapter XXIV. What has been said about breeds of horses holds also with cattle. Lay more stress on type and purpose. Be sure of the definitions of parts. The score cards given on pages 291 and 292 are useful for fixing points in the minds of the pupils. Time: one week.

23. Domestic Animals; Sheep, Goats, and Swine.

Chapters XXV and XXVI. It is suggested that more importance should be given to such animals as are more common in the community. More attention may be given to breeds than should be done with horses or cattle. Do not fail to bring the pupils in direct contact with the animals being discussed. Time: one week.

24. Poultry Production.

Chapter XXVII. Fortunately this chapter is comprehensive and needs little analysis. The importance of poultry management is generally recognized. The topic should be handled thoroughly. The grade fowl is rapidly passing and breeds are usually distinct; therefore, study breeds and their relation to production. Have pupils bring individual fowls to school for judging. Time: two weeks.

If time permitted, the remaining chapters in the text may be studied with profit but they may be left out without loss. Bees are a specialty, feeds and feeding is rather abstruse for grade pupils, and the remaining chapters are not elementary in their treatment of the subjects included. Table XIII, beginning on page 408, which contains suggestions to teachers for additional exercises and projects, should be kept constantly in mind in connection with this outline.

SUGGESTED TREATMENT OF TOPIC

I. Topic: THE STRUCTURE AND PHYSIOLOGY OF PLANTS

Lesson division of topic—

1. Study of parts of plants.
2. Study how plants breathe.
3. Study how plants get water.
4. Study how plants get food.
5. Study how plants produce flowers and seeds.

LESSON 1.—Pages 8 to 10—LEAF STRUCTURE

Subject Matter and Method

- (1) Definition of parts of the plant. Illustrate with growing specimens showing entire plant, including flower and seed.
 - a. Roots.—Their purpose, appearance, manner of growth. Root hairs—Use demonstration as shown on page 9. (Material for this should be prepared ten days previously, but specimens can often be secured on roots of wheat or other plants carefully washed.)
 - b. Stems.—Their uses and functions. Use exercise, page 10.
 - c. Leaves.—Work of leaves. Explain their service to the whole plant. If time permits prepare demonstration as shown in Fig. 36, showing escape of moisture from leaves.

XI. Topic: ALFALFA

Lesson division of topic—

1. The value of alfalfa and its uses.
2. Seeding and cultivating.
3. Inoculation.
4. Cutting the crop for hay.
5. Feeding and marketing.

Subject Matter and Method

- (1) Procure a specimen alfalfa plant by digging carefully so as not to disturb the roots. Find the nodules on the roots and explain their presence.
- (2) Explain germ life in this connection and show how it is transmitted.
- (3) Do not fail to connect up the question of soil fertility with the bacterial growth.

XXI. Topic: DOMESTIC ANIMALS—THE HORSE

Lesson division of topic—

1. How have domestic animals been produced?
2. Types of horses and draft breeds.
3. General purpose and light horse breeds.
4. Care and management of horses.
5. Inspection and judging of horses.

LESSON 5—Pages 271 to 273—INSPECTION AND JUDGING

Subject Matter and Method

- (1) Secure a horse for study; any kind will serve for purposes of study. Better ask the assistance of some local farmer or horseman. Pupils should be sure of their knowledge of terms and definitions as applied to the animal. Examine for defective vision, hearing, bad teeth. Look for defects, diseases, scars and blemishes.
- (2) Exercise the horse in order to observe lameness or peculiarities of action. Note the breathing.
- (3) Study the temperament.
- (4) Follow the inspection by score card judging in order to fix the points brought out in this study.



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